

Schottky Diode

$$V_{RRM} = 45 \text{ V}$$

$$I_{FAV} = 2 \times 40 \text{ A}$$

$$V_F = 0.46 \text{ V}$$

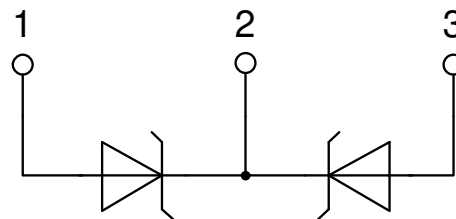
High Performance Schottky Diode
 Low Loss and Soft Recovery
 Common Cathode

Part number

DSSK80-0045B



Backside: cathode



Features / Advantages:

- Very low V_f
- Extremely low switching losses
- Low I_{rm} values
- Improved thermal behaviour
- High reliability circuit operation
- Low voltage peaks for reduced protection circuits
- Low noise switching

Applications:

- Rectifiers in switch mode power supplies (SMPS)
- Free wheeling diode in low voltage converters

Package: TO-247

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

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Schottky				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					45	V
V_{RRM}	max. repetitive reverse blocking voltage					45	V
I_R	reverse current, drain current	$V_R = 45\text{ V}$	$T_{VJ} = 25^\circ\text{C}$			20	mA
		$V_R = 45\text{ V}$	$T_{VJ} = 100^\circ\text{C}$			250	mA
V_F	forward voltage drop	$I_F = 40\text{ A}$	$T_{VJ} = 25^\circ\text{C}$			0.51	V
		$I_F = 80\text{ A}$				0.69	V
		$I_F = 40\text{ A}$	$T_{VJ} = 125^\circ\text{C}$			0.46	V
		$I_F = 80\text{ A}$				0.68	V
I_{FAV}	average forward current	$T_C = 125^\circ\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 150^\circ\text{C}$			40	A
V_{FO}	threshold voltage	} for power loss calculation only				0.23	V
r_F	slope resistance					5.3	mΩ
R_{thJC}	thermal resistance junction to case					0.8	K/W
R_{thCH}	thermal resistance case to heatsink				0.25		K/W
P_{tot}	total power dissipation			$T_C = 25^\circ\text{C}$		155	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}; V_R = 0\text{ V}$	$T_{VJ} = 45^\circ\text{C}$			750	A
C_J	junction capacitance	$V_R = 5\text{ V}$ $f = 1\text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$		2.93		nF
E_{AS}	non-repetitive avalanche energy	$I_{AS} = 31\text{ A}$ $L = 180\text{ }\mu\text{H}$	$T_{VJ} = 25^\circ\text{C}$			137	mJ
I_{AR}	repetitive avalanche current	$V_A = 1.5 \cdot V_R$ typ. $f = 10\text{ kHz}$				3.1	A



Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal ¹⁾			70	A
T_{VJ}	virtual junction temperature		-55		150	°C
T_{op}	operation temperature		-55		125	°C
T_{stg}	storage temperature		-55		150	°C
Weight				6		g
M_D	mounting torque		0.8		1.2	Nm
F_C	mounting force with clip		20		120	N

Product Marking



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	DSSK80-0045B	DSSK80-0045B	Tube	30	475580

Similar Part	Package	Voltage class
DSB80C45HB	TO-247AD (3)	45

Equivalent Circuits for Simulation

** on die level*

$T_{VJ} = 150^{\circ}C$



Schottky

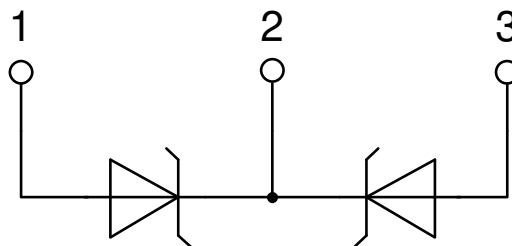
$V_{0\ max}$	threshold voltage	0.23	V
$R_{0\ max}$	slope resistance *	2.8	mΩ



Outlines TO-247



Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
e	0.215 BSC		5.46 BSC	
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
Ø P	0.140	0.144	3.55	3.65
Q	0.212		5.38	
S	0.242 BSC		6.14 BSC	
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
c	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
Ø P1	-	0.29	-	7.39



Schottky

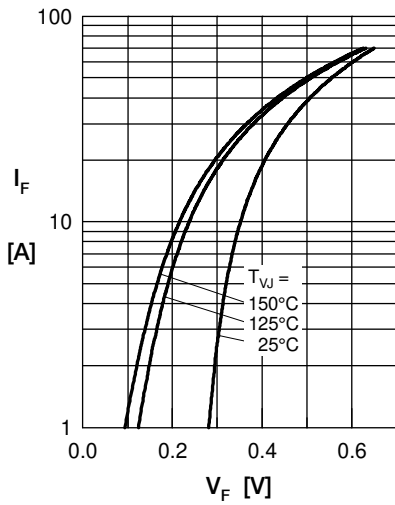


Fig. 1 Max. forward voltage drop characteristics

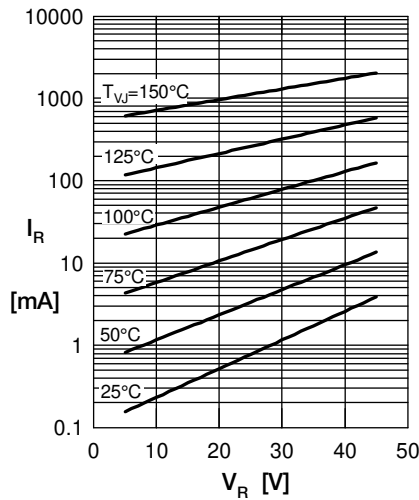


Fig. 2 Typ. reverse current I_R vs. reverse voltage V_R

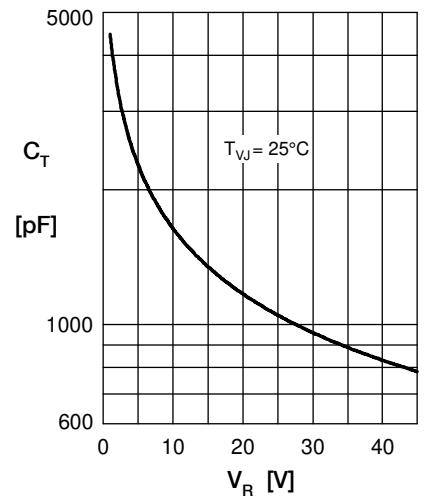


Fig. 3 Typ. junction capacitance C_T vs. reverse voltage V_R

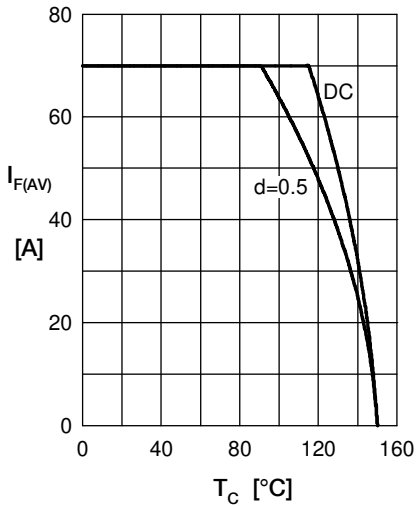


Fig. 4 Average forward current $I_{F(AV)}$ vs. case temp. T_C

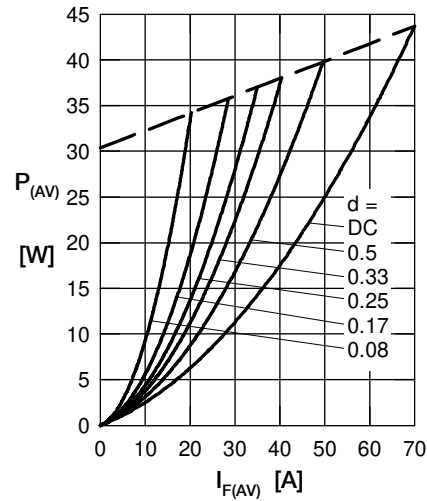


Fig. 5 Forward power loss characteristics

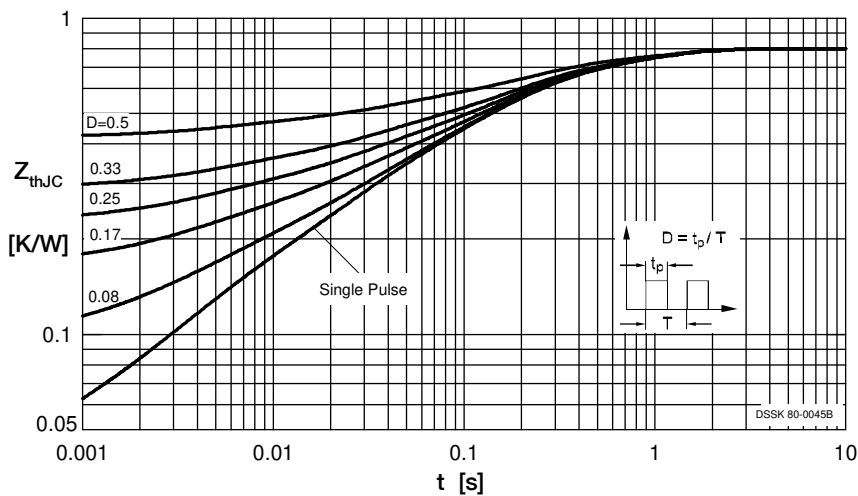


Fig. 6 Transient thermal impedance junction to case at various duty cycles

Note: All curves are per diode